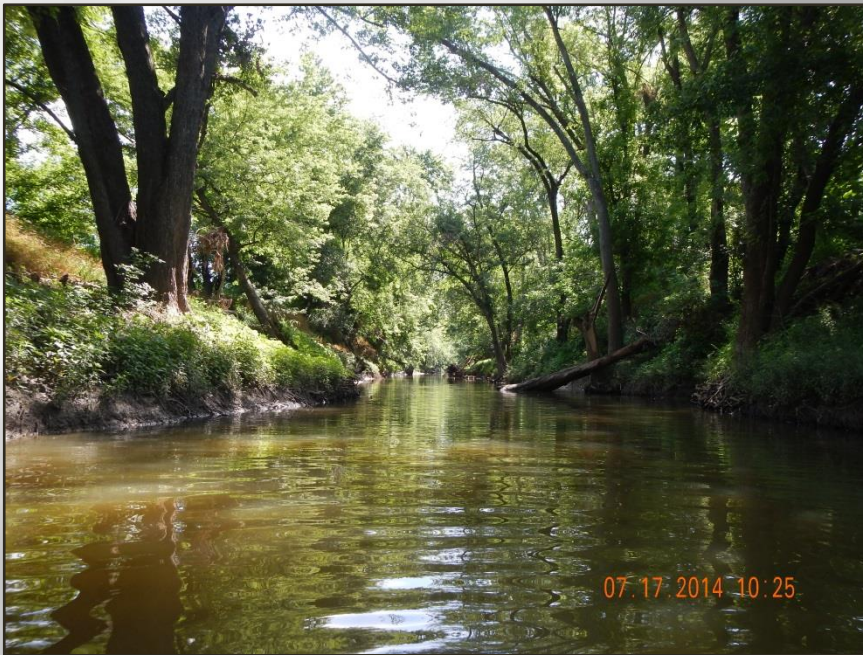


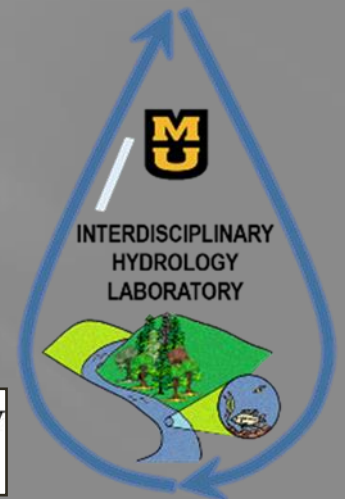
PHYSICAL HABITAT ASSESSMENT OF HINKSON CREEK, BOONE COUNTY, MISSOURI



Lynne W. Hooper
Jason A. Hubbard

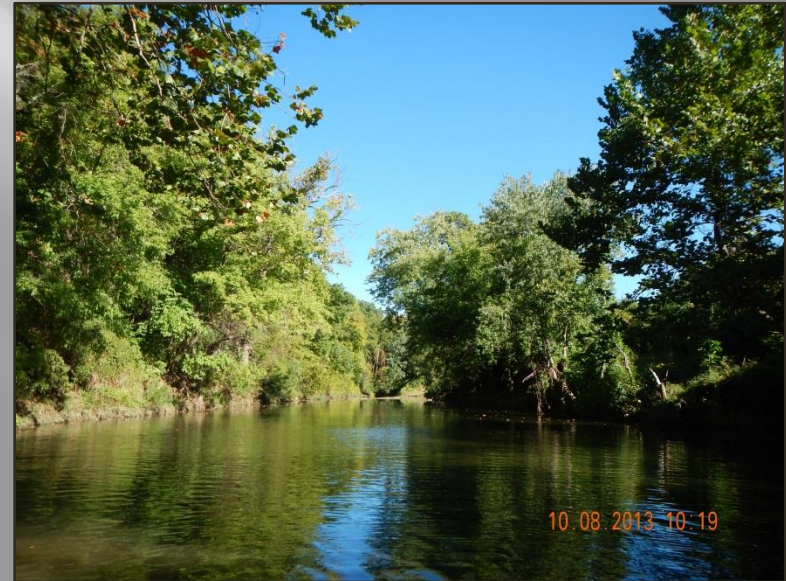
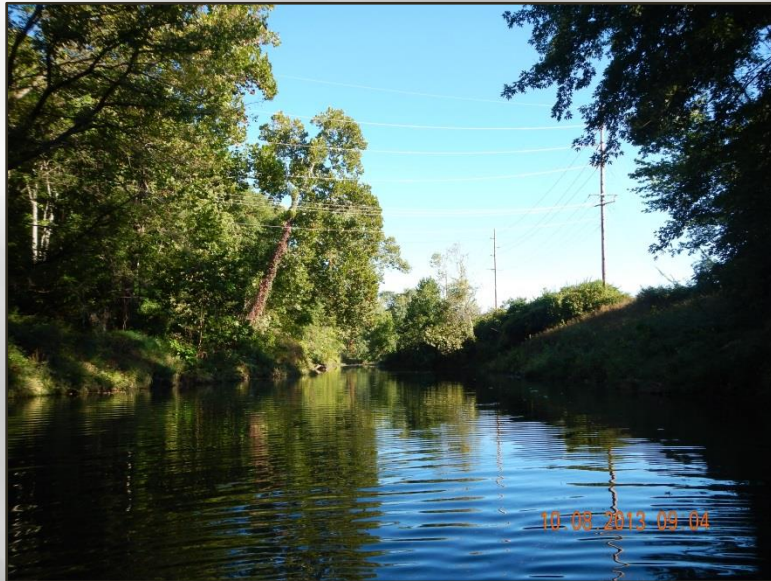


Center for Watershed Management and Water Quality
College of Agriculture, Food and Natural Resources



Introduction (Background)

- Hydrogeomorphology creates physical habitat
- Human land use alters hydrogeomorphology
- Result → altered physical habitat heterogeneity
- Habitat needs often vary with life stage



Trench pool just downstream of site 4 in Hinkson Creek.

Introduction (Physical Habitat Assessment)

- Physical constraints control stream response
- Habitat available for aquatic biota
- Status of hydrologic connectivity
- Correlations with human land use
- Stream restoration



Objectives of Study

- Focus on physical habitat metrics
- Longitudinal variation in mixed-land-use stream
- Validation of GIS data
- PHA data to better inform management practices



US from RP 1114, near headwaters



US from RP 562, center of watershed

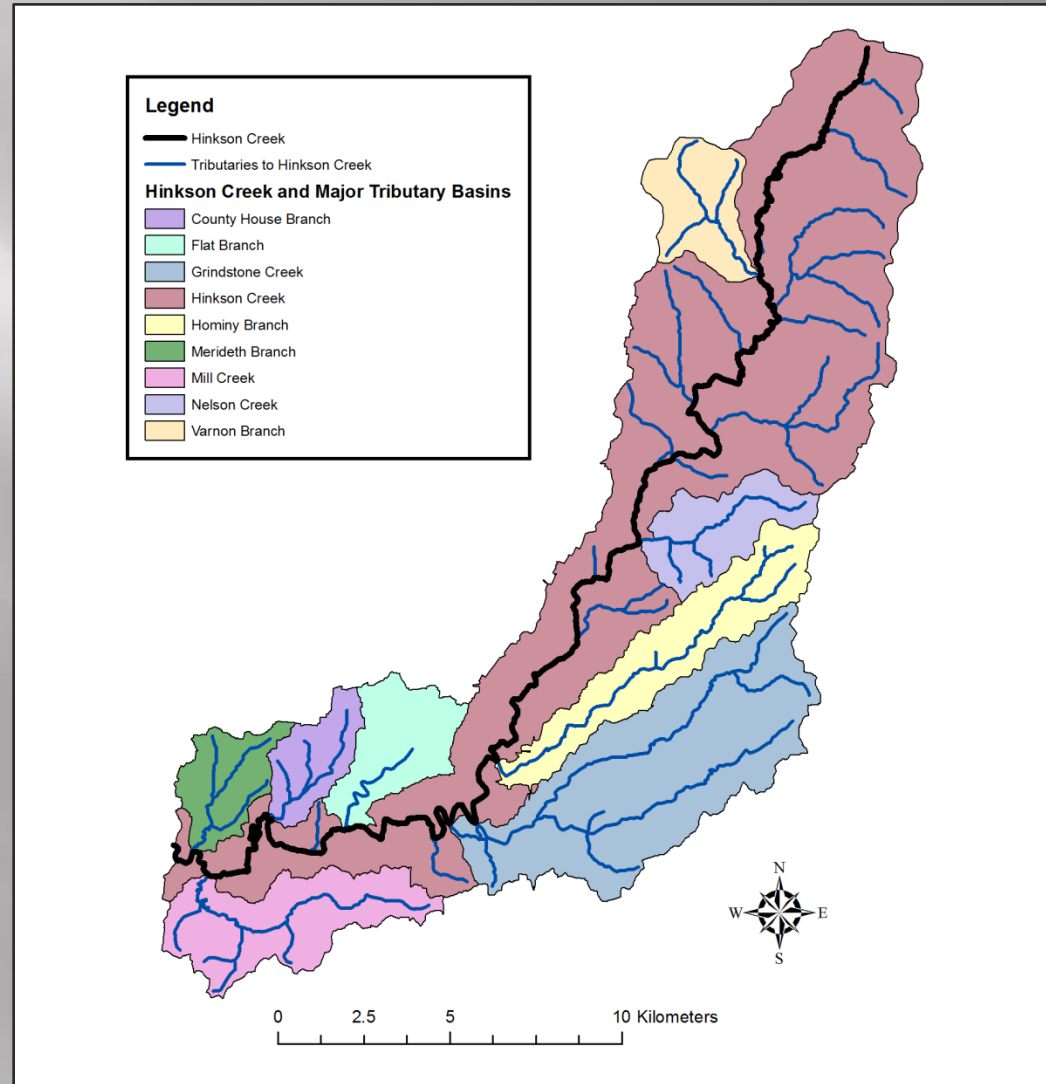


Looking US from mouth

Longitudinal variation in Hinkson Creek

Materials and Methods

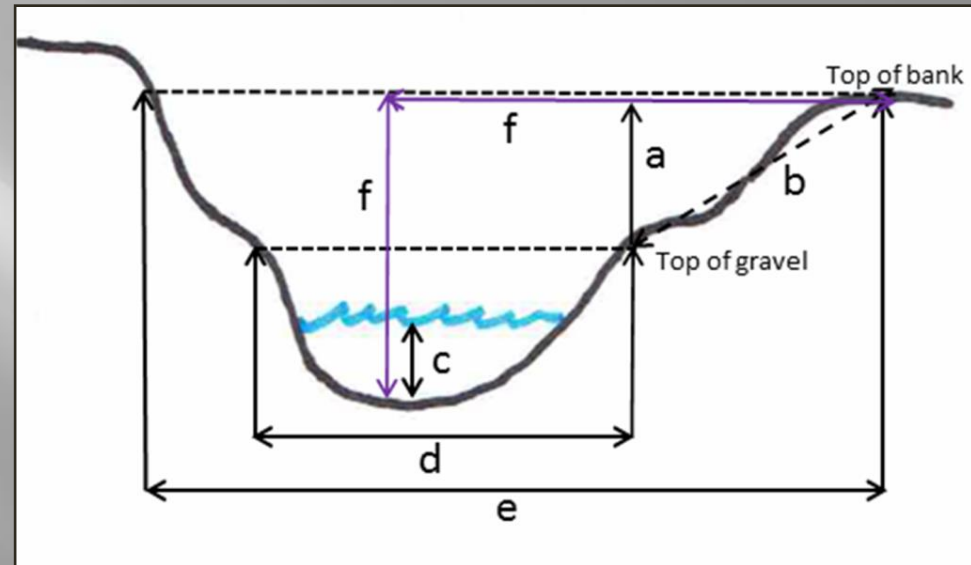
Study site



Materials and Methods

Field protocol

- **Coordinates**
 - MoRAP and observed
- **Bank measurements**
 - Bank slope and bank height
- **Channel measurements**
 - Depth, widths, thalweg position, and canopy cover
- **Substrate quantification**
 - Pebble count and % vertical embeddedness



Materials and Methods

Field protocol

- **Thalweg profile**
 - Depth and substrate particle size
- **Confluences**
 - Three transect approach
- **Photographic database**
 - Standard channel photographs and special features
- **Resurveys**



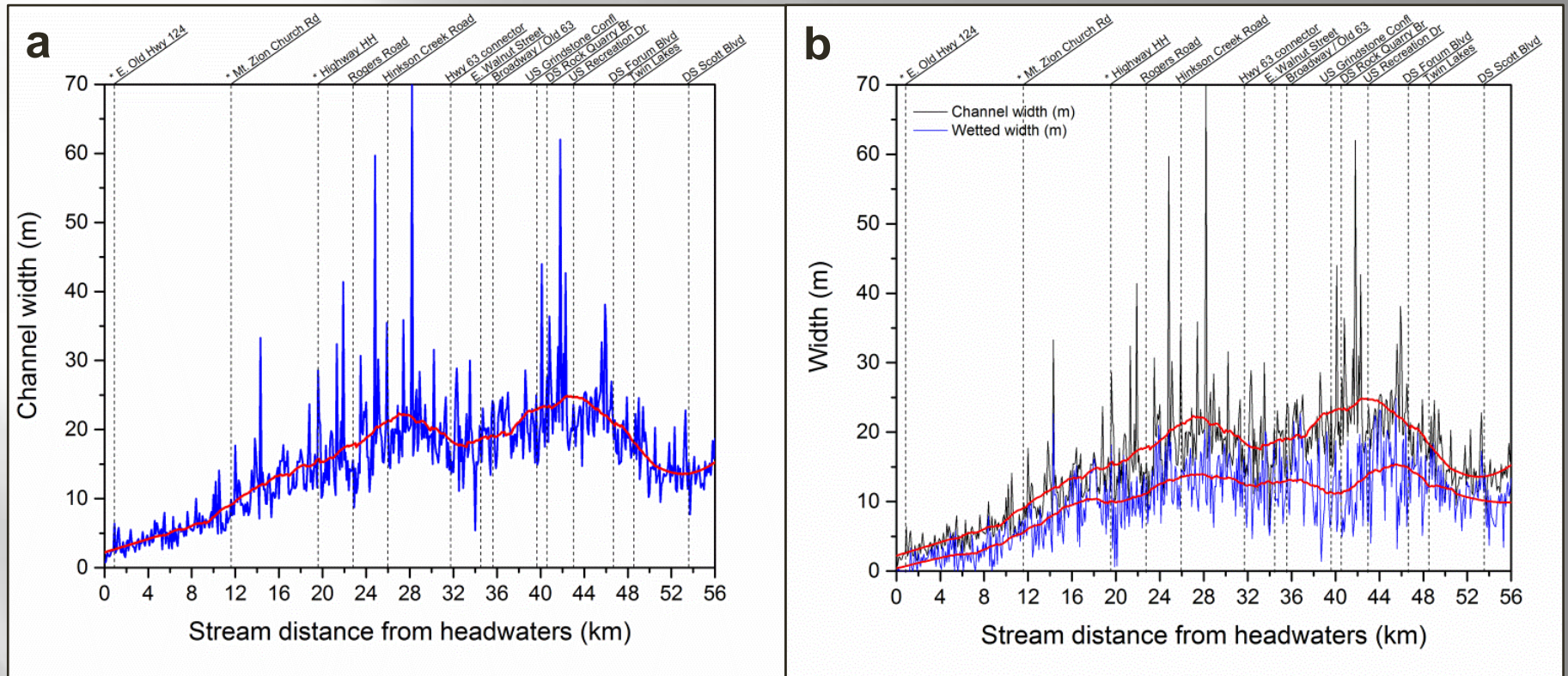
Hinkson Creek, the movie!

Data Analysis

- Descriptive statistics of observed data
- Longitudinal variation analysis
- Comparison of GIS to observed data
- Regression, Student's T-test, ANOVA

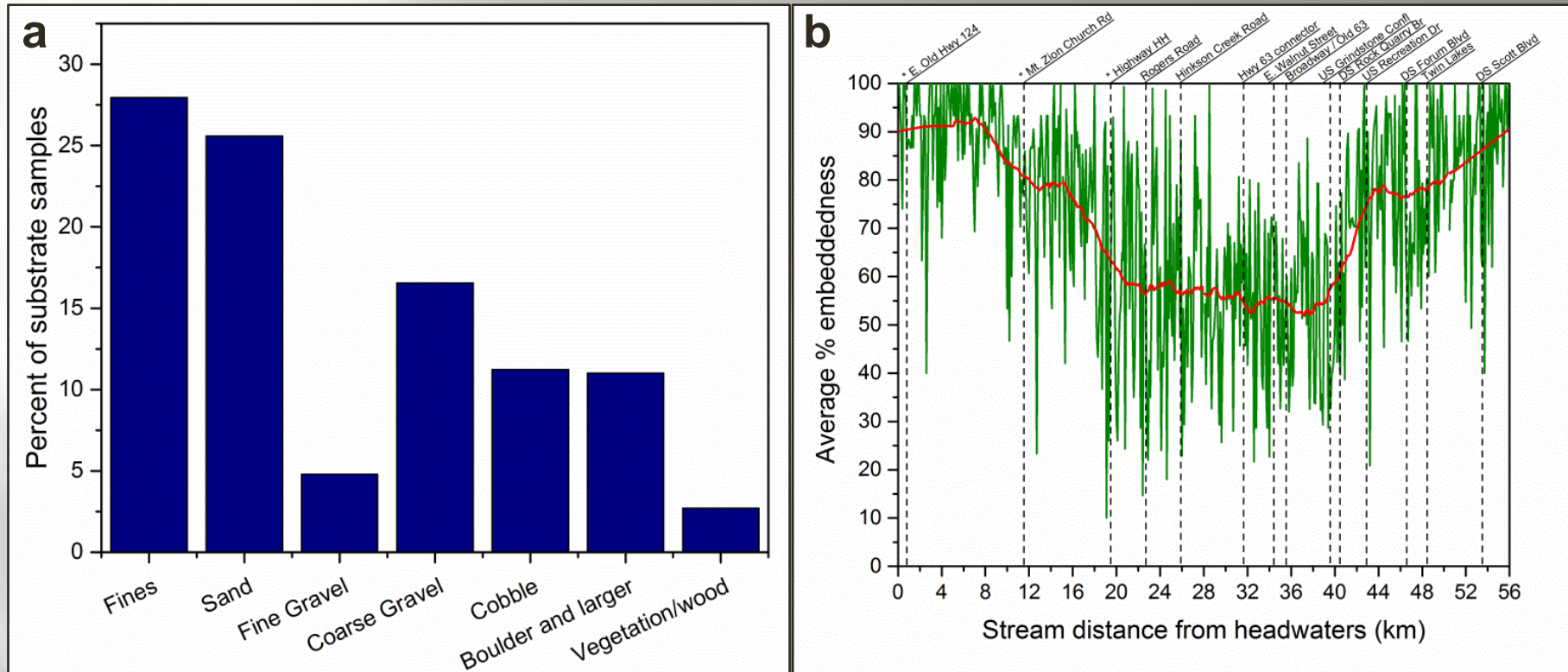
Statistic	Left bank (°)	Right bank (°)	Channel width (m)	Wetted width (m)	Bankfull width (m)	Bank height (m)
Maximum	100.0	96.0	70.0	24.9	74.0	5.7
Minimum	2.0	0.0	0.8	0.0	1.8	0.2
Mean	34.6	35.5	15.4	9.8	24.2	2.6
Median	34.0	32.0	15.3	9.9	25.1	2.4
Standard deviation	15.8	16.4	8.2	5.5	9.4	1.0

Results



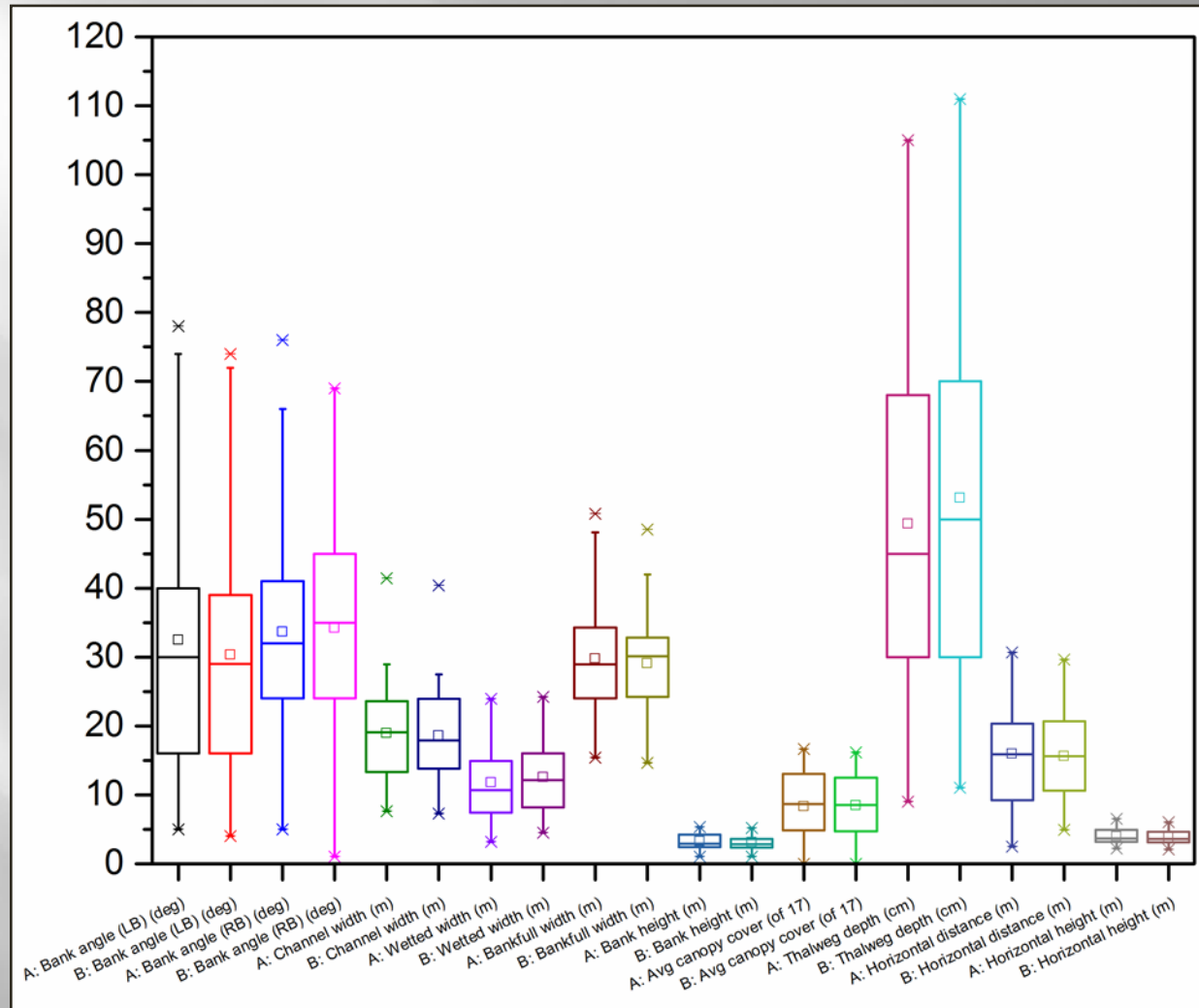
Channel width (a) and channel v. wetted width (b) with stream distance.

Results



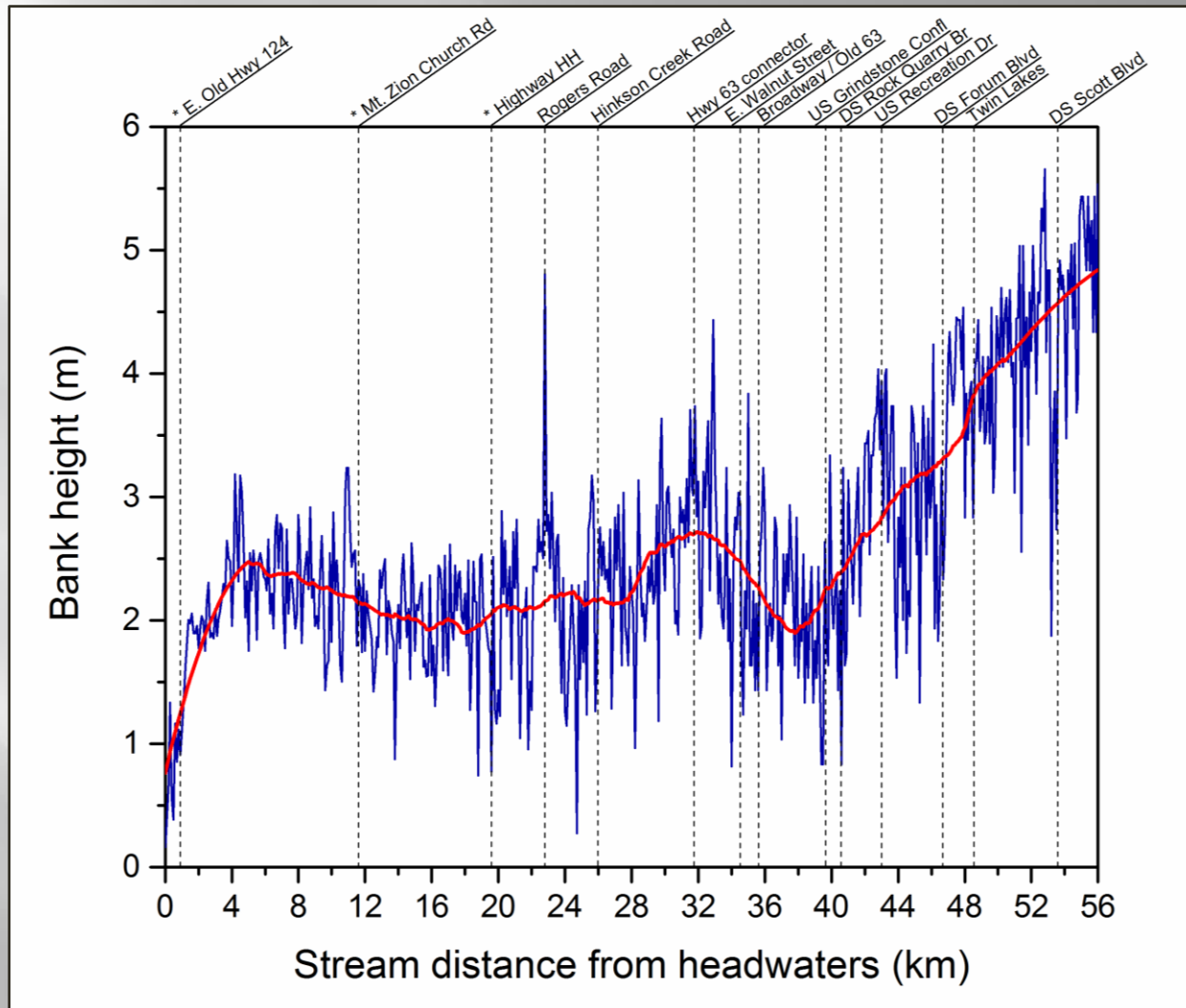
Percent of substrate samples in size classes (a) and average percent vertical embeddedness with stream distance (b).

Results



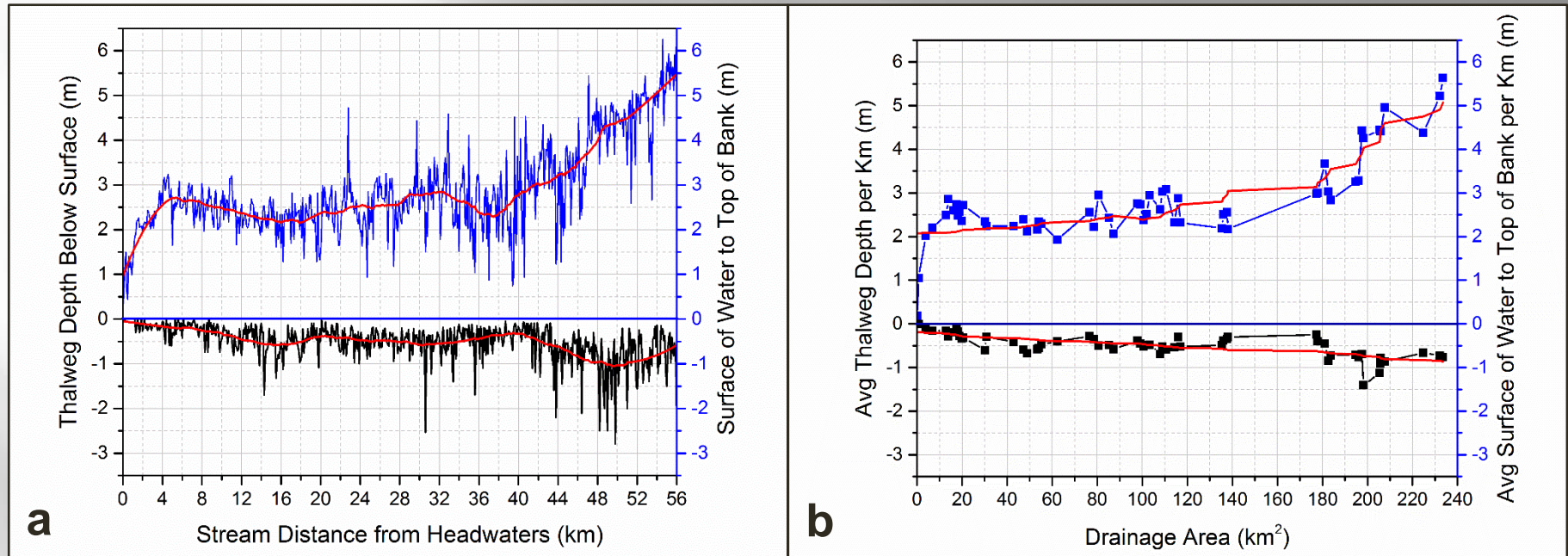
Box and whisker plot of comparison of initial survey metric (A) and resurveyed metric (B) at resurvey points.

Results



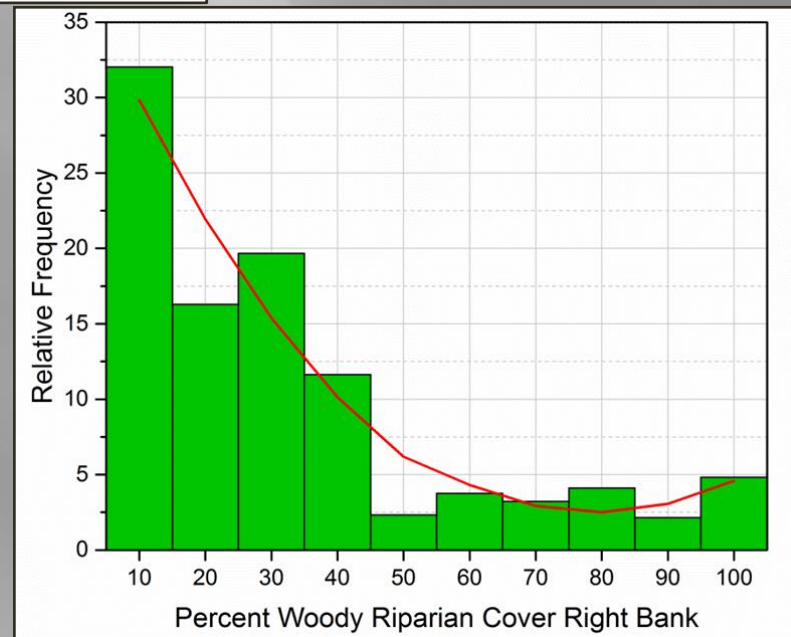
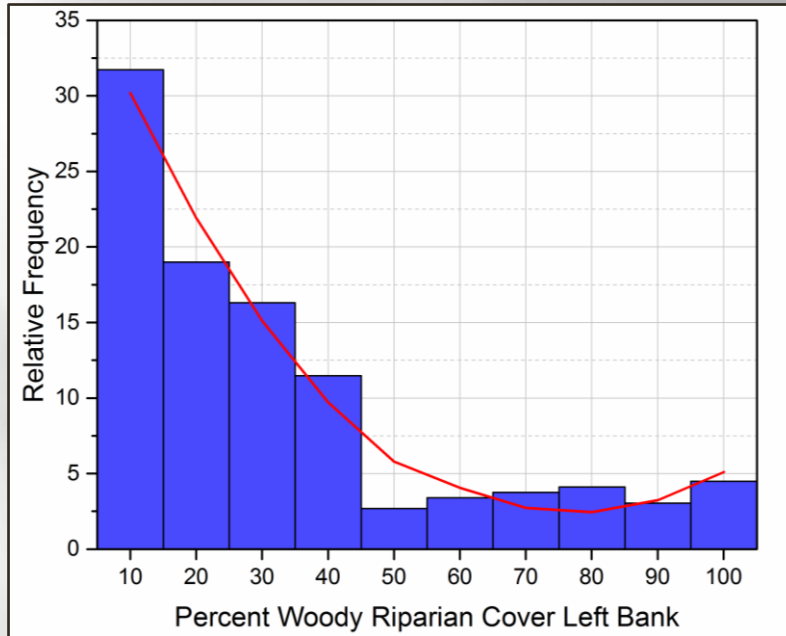
Bank height with stream distance from headwaters.

Results

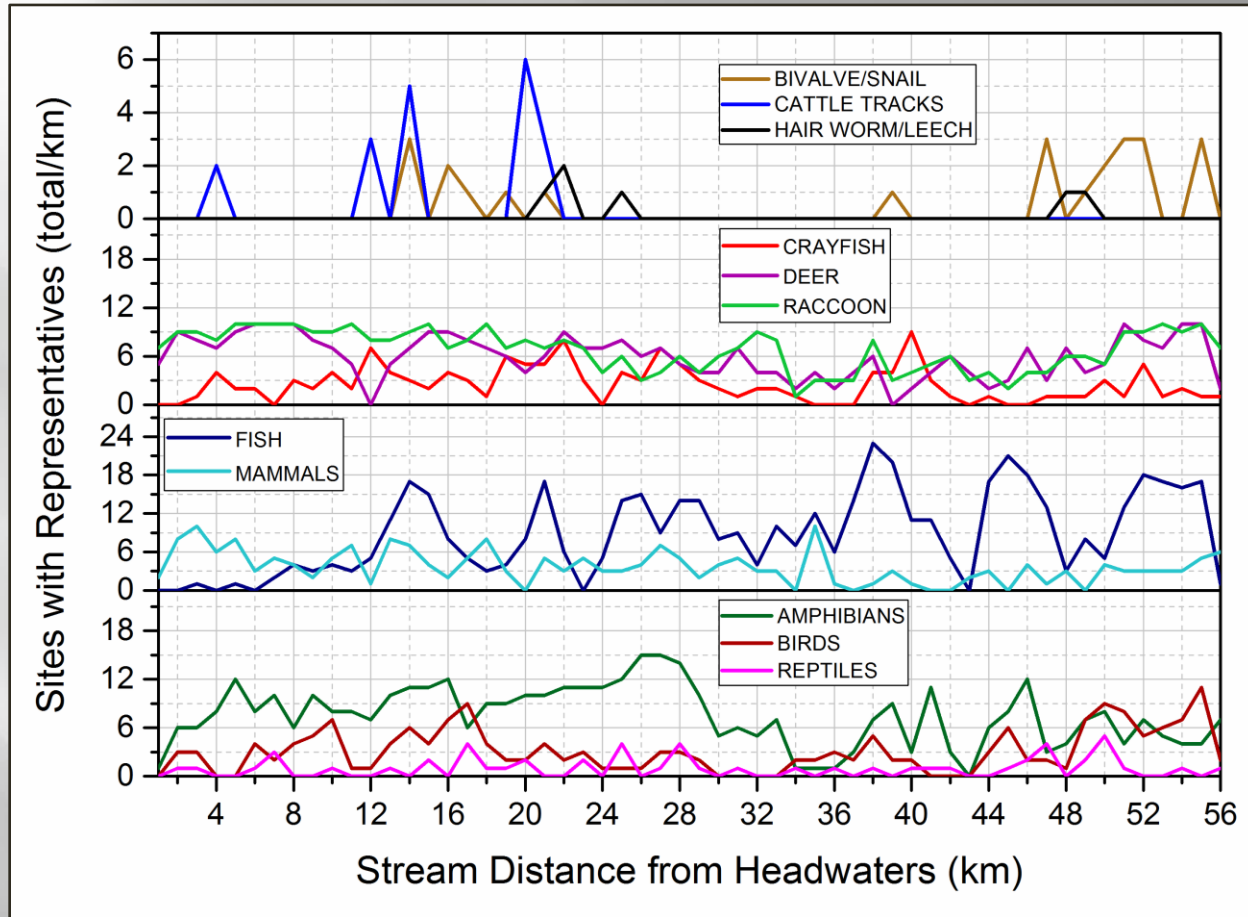


Thalweg depth and distance from surface of water to top of bank with stream distance, with 100 pt moving average in red (a); Average thalweg depth per km and average distance from surface of the water to the top of the bank per km with drainage area, 50 pt moving average in red (b).

Results



Results



Categories of wildlife grouped by number of representatives sited per kilometer of stream distance along Hinkson Creek during the PHA.

Contribution to Science

- High resolution PHA dataset
- Multiple land-use watershed – broad applicability
- Development of better-management practices
- Possible identification of sites for restoration



Acknowledgements

University of Missouri – Columbia
Boone County, Missouri
City of Columbia, Missouri

Jason A. Hubbart, Ph.D.

Greg Hosmer
Elliott Kellner
Mike Hogan
Jodi Whittier, Ph.D.



Questions?



08.13.2014 10:03